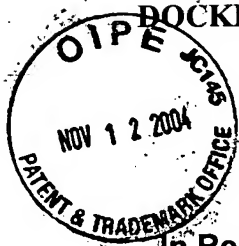


10/036,810

11-15-04

edc



DOCKET NO.: MSFT-3949/190508.01

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Michael J. Sinclair

Confirmation No.: 5314

Patent No.: 6,804,959 B2

Issued: October 19, 2004

Application No.: 10/036,810

Filing Date: December 31, 2001

For: UNILATERAL THERMAL BUCKLE-BEAM ACTUATOR

EXPRESS MAIL LABEL NO: EL 999 299 361 US
DATE OF DEPOSIT: November 12, 2004

EL999299361US

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Certificate
NOV 22 2004
of Correction

Dear Sir:

REQUEST FOR CERTIFICATE OF CORRECTION OF PATENT FOR PTO MISTAKE
PURSUANT TO 37 CFR § 1.322(a)

It is respectfully requested that a Certificate of Correction be issued for the above-identified patent. In accordance with 37 CFR § 1.322(a), the patent has errors in it that occurred through the fault of the Patent and Trademark Office as clearly disclosed by the records and files of the office.

Claims 34 and 35 were added by Amendment filed **June 14, 2004**. (A copy of this Amendment and a copy of the return postcard bearing the PTO date stamp are enclosed). In a Patent Office Communication dated **July 15, 2004** the Examiner wrote "I approved and entered the 312 Amendment of 06/14/04." (A copy of this Communication is also enclosed).

NOTE: The claims as filed were renumbered on the issued patent by the Examiner as claims 1-31.

Enclosed herewith please find a completed Certificate of Correction form.

DOCKET NO.: MSFT-3949/190508.01

PATENT

Since the errors are not due to applicants' mistake, no correction fee is due. Please charge any fees for copies and any additional fees to our Deposit Account No. 23-3050. This letter is enclosed in duplicate.

Date: 11/11/04



Daniel J. Goettle
Registration No. 50,983

Woodcock Washburn LLP
One Liberty Place - 46th Floor
Philadelphia PA 19103
Telephone: (215) 568-3100
Facsimile: (215) 568-3439

© 2004 WW

30 NOV 2004

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO : 6,804,959 B2
DATED : October 19, 2004
INVENTOR(S) : Michael J. Sinclair

It is certified that errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

32. *[originally claim 34]*. The actuator of claim 22 *[originally claim 23]* in which the floating cold beam is wider along a central region than at the cold beam ends.

33. *[originally claim 35]*. The actuator of claim 19 *[originally claim 20]* in which the thermal half-beams are tapered from their centers toward their ends.

MAILING ADDRESS OF SENDER: Woodcock Washburn

One Liberty Place, 46th Floor
Philadelphia, PA 19103

PATENT NO. 6,804,959 B2

No. of additional copies



This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending on individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

30 NOV 2004



**UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION**

PATENT NO : 6,804,959 B2
DATED : October 19, 2004
INVENTOR(S) : Michael J. Sinclair

It is certified that errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

32. *[originally claim 34]*. The actuator of claim 22 *[originally claim 23]* in which the floating cold beam is wider along a central region than at the cold beam ends.

33. *[originally claim 35]*. The actuator of claim 19 *[originally claim 20]* in which the thermal half-beams are tapered from their centers toward their ends.

MAILING ADDRESS OF SENDER: Woodcock Washburn

One Liberty Place, 46th Floor
Philadelphia, PA 19103

PATENT NO. 6,804,959 B2

No. of additional copies



This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending on individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

**RECEIVED BY THE UNITED STATES
PATENT AND TRADEMARK OFFICE**

Paper: Transmittal Letter Accompanying Amendment After Allowance Pursuant to 37 CFR 1.312, with Certificate of Mailing; Amendment After Allowance Pursuant to 37 CFR 1.312, with Certificate of Mailing; Associate Power of Attorney; and return receipt postcard.

Applicant(s): Sinclair

Title: Unilateral Thermal Buckle-Beam Actuator

Application No.: 10/036,810

Filed: December 31, 2001

Docket No.: MSFT-3949

Date Sent: June 8, 2004

Sent By: Rocci/Goettle/Jdavies



COPY

30 NOV 2004



DOCKET NO.: MSFT-3949 (190508.01)

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:
Michael J. Sinclair

Confirmation No.: 5314

Application No.: 10/036,810

Group Art Unit: 3748

Filing Date: December 31, 2001

Examiner: H. M. Nguyen

For: UNILATERAL THERMAL BUCKLE-BEAM ACTUATOR

DATE OF DEPOSIT: June 8, 2004

I HEREBY CERTIFY THAT THIS PAPER IS BEING
DEPOSITED WITH THE UNITED STATES POSTAL
SERVICE AS FIRST CLASS MAIL, POSTAGE PREPAID,
ON THE DATE INDICATED ABOVE AND IS
ADDRESSED TO THE COMMISSIONER FOR PATENTS,
P.O. BOX 1450, ALEXANDRIA, VA 22313-1450.


TYPED NAME: Daniel J. Goettle
REGISTRATION NO.: 50,983

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

TRANSMITTAL LETTER ACCOMPANYING AMENDMENT AFTER
ALLOWANCE PURSUANT TO 37 CFR § 1.312

Please make the amendments shown in the attached papers in this application in the:

- ☐ abstract.
- ☐ specification.
- ☐ drawings.
- ☒ claims.

☒ This Amendment is needed for proper disclosure or protection of the invention and requires no substantial amount of additional work on the part of the PTO.

☐ This Amendment affects the disclosure or scope of a claim. The attached Amendment sets forth the reasons why the Amendment is needed, why the proposed amended or new claims require no additional search or examination, why the claims are patentable, and why they were not earlier presented.

COPY

30 NOV 2004

DOCKET NO.: MSFT-3949 (190508.01)

PATENT

- ☒ The issue fee:
- ☒ has not been paid.
- ☐ is paid separately herewith.

Date: June 8, 2004



Daniel J. Goettle
Registration No. 50,983

Woodcock Washburn LLP
One Liberty Place - 46th Floor
Philadelphia PA 19103
Telephone: (215) 568-3100
Facsimile: (215) 568-3439

© 2004 WW

COPY



DOCKET NO.: MSFT-3949 (190508.01)
Application No.: 10/036,810
Notice of Allowance Dated: May 3, 2004

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Michael J. Sinclair

Confirmation No.: 5314

Application No.: 10/036,810

Group Art Unit: 3748

Filing Date: December 31, 2001

Examiner: Hoang M. Nguyen

For: Unilateral Thermal Buckle-Beam Actuator

DATE OF DEPOSIT: June 8, 2004

I HEREBY CERTIFY THAT THIS PAPER IS BEING
DEPOSITED WITH THE UNITED STATES POSTAL
SERVICE AS FIRST CLASS MAIL, POSTAGE PREPAID,
ON THE DATE INDICATED ABOVE AND IS
ADDRESSED TO THE COMMISSIONER FOR PATENTS,
P.O. BOX 1450, ALEXANDRIA, VA 22313-1450.

TYPED NAME: Daniel J. Goettle
REGISTRATION NO.: 50,983

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

AMENDMENT AFTER ALLOWANCE PURSUANT TO 37 CFR § 1.312

In response to the Notice of Allowance dated May 3, 2004, reconsideration is respectfully requested in view of the amendments and/or remarks as indicated below:

- ☐ Amendments to the Specification begin on page _____ of this paper.
- ☒ Amendments to the Claims are reflected in the listing of the claims which begins on page 2 of this paper.
- ☐ Amendments to the Drawings begin on page _____ of this paper and include an attached replacement sheet.
- ☒ Remarks begin on page 7 of this paper.

COPY

30 NOV 2004

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Previously presented) A thermal microelectrical mechanical actuator, comprising:
 - a planar substrate with first and second anchors secured thereto;
 - an in-plane shuttle floating on the substrate for motion parallel to the planar substrate;
 - an elongate floating cold beam that is transverse to the length of the in-plane shuttle, the floating cold beam being coupled at one end to the in-plane shuttle and at another end to the substrate;
 - plural elongated thermal half-beams that each have a base end secured to the first anchor and a distal end secured to the in-plane shuttle;
 - plural elongated thermal half-beams that each have a base end secured to the second anchor and a distal end secured to the in-plane shuttle;
 - and
 - electrical couplings to direct electrical current through the thermal half beams via the anchors to impart thermal expansion of the thermal half-beams and motion of their distal ends.
2. (Original) The actuator of claim 1 in which the in-plane shuttle has a length and two sides along its length and the first and second anchors are positioned to one side of the in-plane shuttle.
3. (Cancelled)
4. (Original) The actuator of claim 2 in which the thermal half-beams have more mass near their centers than at their ends.
5. (Original) The actuator of claim 4 in which the thermal half-beams are wider near their centers than at their ends.
6. (Original) The actuator of claim 1 in which each thermal half-beam is secured between its anchor and the in-plane shuttle at a non-orthogonal bias angle.

7. (Original) The actuator of claim 1 in which the in-plane shuttle is generally in-plane with the thermal half beams.
8. (Original) The actuator of claim 1 further including an alignment structure that is secured to the substrate and slidably engages the in-plane shuttle to constrain it to move generally parallel to the substrate.
9. (Original) The actuator of claim 1 in which the in-plane shuttle further includes one or more dimple bearings that project from the in-plane shuttle toward the substrate.
10. (Original) The actuator of claim 1 in which the thermal half-beams are formed of a material with a positive thermal coefficient of expansion.
11. (Original) The actuator of claim 1 in which the thermal half-beams have more mass near their centers than at their ends.
12. (Original) The actuator of claim 1 in which the thermal half-beams are tapered from their centers toward their ends.
13. (Original) The actuator of claim 1 in which the thermal half-beams have in-plane widths that are tapered from the centers of the thermal half-beams toward their ends.
14. (Original) The actuator of claim 13 in which the centers of the thermal halfbeams have widths that are about twice those of the ends of the thermal half-beams.
15. (Original) The actuator of claim 1 in which the in-plane shuttle has a length and two sides along its length and the first and second anchors are positioned on opposite sides of the in-plane shuttle and the thermal half-beams have more mass near their centers than at their ends.

16. (Original) The actuator of claim 15 in which the thermal half-beams are wider near their centers than at their ends.
17. (Original) The actuator of claim 16 in which the centers of the thermal halfbeams have widths that are about twice those of the ends of the thermal halfbeams.
18. (Original) The actuator of claim 15 in which the thermal half-beams are tapered from their centers toward their ends.
19. (Previously presented) The actuator of claim 1 in which the floating cold beam is wider along a central region than at the cold beam ends.
20. (Original) A thermal microelectrical mechanical actuator, comprising:
a planar substrate with a pair of anchors secured thereto;
plural elongated thermal half-beams each have a base end secured to one of the anchors and a distal end secured to an in-plane shuttle having a length, the thermal half-beams having base ends secured to the pair of anchors being generally parallel to each other;
an elongate floating cold beam that is transverse to the length of the in-plane shuttle, the floating cold beam being coupled at one end to the in-plane shuttle and at another end to the substrate; and
electrical couplings to direct electrical current through the thermal half beams via the anchors to impart thermal expansion of the thermal half-beams and motion of their distal ends.
21. (Original) The actuator of claim 20 in which the in-plane shuttle has a length and two sides along its length and the first and second anchors are positioned to one side of the in-plane shuttle.
22. (Original) The actuator of claim 20 in which the thermal half-beams have more mass near their centers than at their ends.

23. (Original) The actuator of claim 20 in which the thermal half-beams are wider near their centers than at their ends.
24. (Original) The actuator of claim 23 in which the centers of the thermal half-beams have widths that are about twice those of the ends of the thermal half-beams.
25. (Cancelled)
25. (Cancelled)
26. (Original) The actuator of claim 20 in which each thermal half-beam is secured between its anchor and the in-plane shuttle at a non-orthogonal bias angle.
27. (Original) The actuator of claim 20 in which the in-plane shuttle is generally in-plane with the thermal half beams.
28. (Original) The actuator of claim 20 further including an alignment structure that is secured to the substrate and slidably engages the in-plane shuttle to constrain it to move generally parallel to the substrate.
29. (Original) The actuator of claim 20 in which the in-plane shuttle further includes one or more dimple bearings that project from the in-plane shuttle toward the substrate.
30. (Original) The actuator of claim 20 in which the thermal half-beams are formed of a material with a positive thermal coefficient of expansion.
31. (Original) The actuator of claim 20 in which the floating cold beam is wider along a central region than at the cold beam ends.
32. (Previously presented) A thermal microelectrical mechanical actuator, comprising:
a planar substrate with first and second anchors secured thereto;

an in-plane shuttle floating on the substrate for motion parallel to the planar substrate;
plural elongated thermal half-beams that each have a base end secured to the first anchor and a distal end secured to the in-plane shuttle, the thermal half-beams being tapered from their centers toward their ends;

plural elongated thermal half-beams that each have a base end secured to the second anchor and a distal end secured to the in-plane shuttle; and

electrical couplings to direct electrical current through the thermal half beams via the anchors to impart thermal expansion of the thermal half-beams and motion of their distal ends.

33. (Currently amended) The actuator of claim ~~34~~ 32 in which the centers of the thermal half-beams have widths that are about twice those of the ends of the thermal halfbeams.

34. (New) The actuator of claim 23 in which the floating cold beam is wider along a central region than at the cold beam ends.

35. (New) The actuator of claim 20 in which the thermal half-beams are tapered from their centers toward their ends.

DOCKET NO.: MSFT-3949 (190508.01)
Application No.: 10/036,810
Notice of Allowance Dated: May 3, 2004


PATENT

REMARKS

The application as filed contained two claims claiming substantively different subject matter but both numbered as claim 25. Therefore, both of these claims labeled as claim 25 have been cancelled and have been added as "new" claims 34 and 35. Claim 34 is identical to the cancelled claim 25 that immediately followed claim 24. Claim 35 is identical to the cancelled claim 25 that immediately preceded claim 26. No new matter has been entered by this amendment.

Additionally, claim 33 on its face and as allowed erroneously depends from claim 34. Claim 33 was intended to depend from independent claim 32, and therefore claim 33 has been amended to correctly reflect this. No new matter has been entered by this amendment.

Date: June 8, 2004



Daniel J. Goettle
Registration No. 50,983

Woodcock Washburn LLP
One Liberty Place - 46th Floor
Philadelphia PA 19103
Telephone: (215) 568-3100
Facsimile: (215) 568-3439



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/036,810	12/31/2001	Michael J. Sinclair	1026-049/MMM 190508.1	5314
21034	7590	07/15/2004		
IPSOLON LLP 805 SW BROADWAY, #2740 PORTLAND, OR 97205				
EXAMINER NGUYEN, HOANG M				
ART UNIT		PAPER NUMBER		
3748				

DATE MAILED: 07/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

RECEIVED
SEP 27 2004
DOCKET DEPT
WWKMN

RECEIVED
SEP 27 2004
Woodcock Washburn

COPY

RECEIVED
SEP 30 2004
Mary Ann Downing
Woodcock Washburn

**SUPPLEMENTAL
Notice of Allowability**

Application No.

10/036,810

Examiner

Hoang M Nguyen

Applicant(s)

SINCLAIR, MICHAEL J.

Art Unit

3748

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 06-14-2004.
2. ☒ The allowed claim(s) is/are 1-2, 3-24, 26-33.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

COPY

Hoang M Nguyen
Primary Examiner
Art Unit: 3748

07-100

QUERY CONTROL FORM		RTIS USE ONLY	
Application No. <u>10/036, 810</u>	Prepared by <u>J. Escarcha</u>	Tracking Number <u>05 952162</u>	
Examiner-GAU <u>Nguyen - 3748</u>	Date <u>6/16/04</u>	Week Date <u>05/17/04</u>	
	No. of queries <u>1</u>	IFW T6	

JACKET			
a. Serial No.	f. Foreign Priority	k. Print Claim(s)	p. PTO-1449
b. Applicant(s)	g. Disclaimer	l. Print Fig.	q. PTOL-85b
c. Continuing Data	h. Microfiche Appendix	m. Searched Column	r. Abstract
d. PCT	i. Title	n. PTO-270/328	s. Sheets/Figs
e. Domestic Priority	j. Claims Allowed	o. PTO-892	t. Other

SPECIFICATION	MESSAGE
a. Page Missing	<u>Claims:</u>
b. Text Continuity	<u>Claim 32 (Orig. 33) have</u>
c. Holes through Data	<u>improper dependency.</u>
d. Other Missing Text	<u>Duplicate claim 24 (Orig. 25)</u>
e. Illegible Text	<u>in text.</u>
f. Duplicate Text	<u>Please advise.</u>
g. Brief Description	<u>Examiner - note 312 amdt. of 6/14/04 -</u>
h. Sequence Listing	<u>cancel both claims 25 + change dependency</u>
i. Appendix	<u>of 33. Please enter if appropriate.</u>
j. Amendments	<u>- d/f</u>
k. Other	
CLAIMS	
a. Claim(s) Missing	
b. Improper Dependency	
c. Duplicate Numbers	
d. Incorrect Numbering	
e. Index Disagrees	
f. Punctuation	
g. Amendments	
h. Bracketing	
i. Missing Text	
j. Duplicate Text	
k. Other	
RESPONSE <u>Corrected! I approved and entered</u>	
<u>the 312 amendment of 06/10/04. That corrected</u>	
<u>the concerned issues set forth above.</u>	
initials <u>W</u>	

COPY